

Telemetry Data Export capability and Telemetry Data Tagging Capability

**draft-[tao-netconf-data-export-capabilities-01](#)
draft-[tao-netconf-notif-node-tag-capabilities-02](#)**

Qin Wu (bill.wu@huawei.com)

Liang Geng(gengliang@chinamobile.com)

Peng Liu(liupengyjy@chinamobile.com) (Presenter)

Hui Cai (caihui@chinamobile.com)

Recap on Telemetry Data Export capability and Telemetry Data Tagging Capability

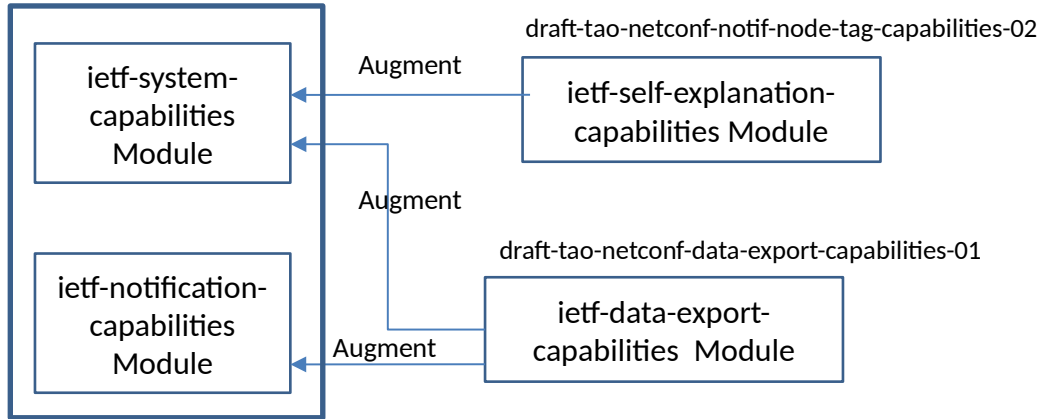
- Using Telemetry Data export capability:
 - allow the client to subscribe datastore node update with specific transport protocol, encoding format, encryption, compression mode;
- Using Telemetry data self explanation tags capability
 - Provide Telemetry data classification and sort out characteristics data
 - Allows clients to automatically select target data objects that are of interests to client application
 - Provide multi-dimensional Network visibility analysis

Document Status

- draft-[tao-netconf-data-export-capabilities-01](#) and draft-[tao-netconf-notif-node-tag-capabilities-02](#)
 - Both were first presented in the IETF 107 meeting, and it was suggested to setup design team to progress this work.
- The latest update of draft-[tao-netconf-data-export-capabilities](#) is v-(01), changes compared to previous versions:
 - Add usage example of telemetry data export;
 - Add timer event support and counter threshold support under per-node-capabilities;
 - Add redundant suppression support under per-node-capabilities;
- The latest update of draft-[tao-netconf-notif-node-tag-capabilities](#) is v-02, changes compared to previous versions:
 - Add usage example of telemetry data tagging
 - Change group-id into self-tag-id
 - Change parent-grouping into multi-source-tag
 - Add clear definition for operation-type attribute

Model Design

draft-ietf-netconf-notification-capabilities-13

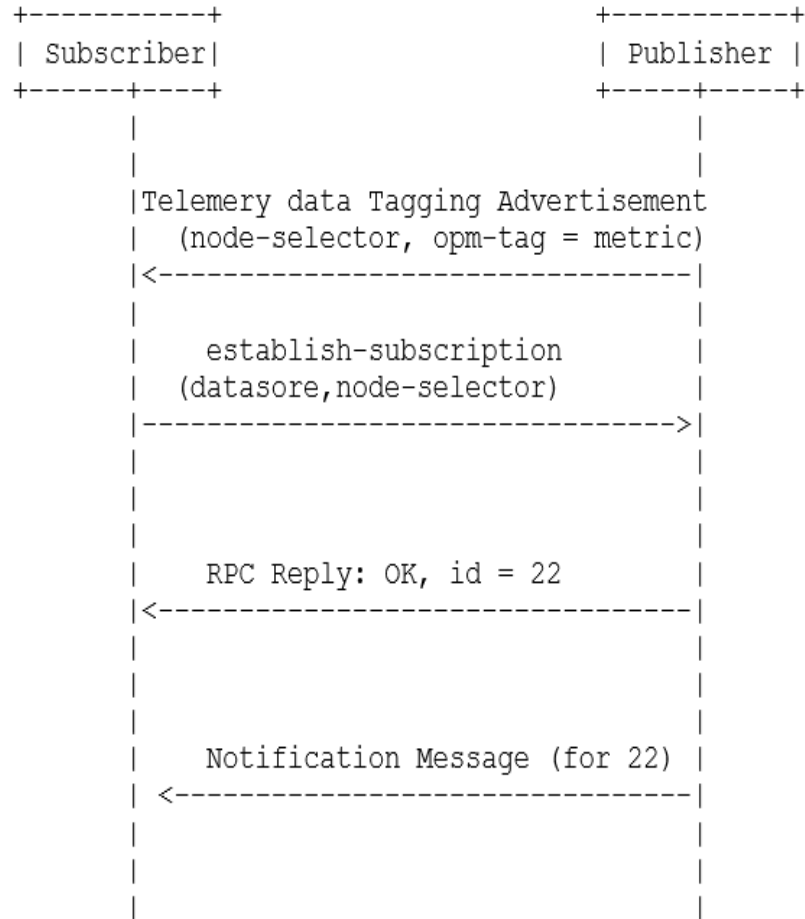


```
module: ietf-self-explanation-capabilities
augment /sysc:system-capabilities/sysc:datastore-capabilities/ +
    sysc:per-node-capabilities/sys:node-selection/sys:node-selector:
  +--ro self-describing-attributes* [self-tag-id]
    +--ro self-tag-id          string
    +--ro opm-tag              tags:tag
    +--ro metric-precision     tags:tag
    +--ro metric-scale         tags:tag
    +--ro operation-type       tags:tag
    +--ro service-tag*         tags:tag
    +--ro task-tag*            tags:tag
    +--ro data-source          tags:tag
    +--ro multi-source-tag     tags:tag
```

```
module: ietf-data-export-capabilities
augment /sysc:system-capabilities:
  +--ro data-export-capabilities
    +--ro transport-protocol?    identityref
    +--ro encoding-format?       identityref
    +--ro security-protocol?     identityref
    +--ro compression-mode?     identityref
    +--ro max-nodes-per-sensor-group? uint32
    +--ro max-sensor-group-per-update? uint32
augment /sysc:system-capabilities/inc:subscription-capabilities:
  +--ro data-export-capabilities
    +--ro message-bundling-support? boolean
    +--ro subscription-mode?       identityref
augment /sysc:system-capabilities/sysc:datastore-capabilities/sysc:per-node-capabilities:
  +--ro data-export-capabilities
    +--ro timer-event-support?      boolean
    +--ro sampling-interval* []
      | +--ro observable-period     centiseconds
      | +--ro count?               uint16
      | +--ro anchor-time?         yang:date-and-time
    +--ro counter-threshold-support? boolean
    +--ro suppress-redundant?      boolean
```

- Two capability modules are proposed, one augment from system capability module, the other augment from system capability and yang push capability module
- In ietf-self-explanation-capabilities module, key capability attributes to be advertised include:
 - Opm-tag: Telemetry data tag for performance metric data object
 - Operation-type: statistics operation on targeted data object, e.g., min,max, sum, average
 - Multi-source-tag: indicate performance metric data object has been aggregated
- In ietf-data-export-capabilities, key capability attributes to be advertised include:
 - Timer-event-support: Timer based trigger on targeted data object is supported in the server
 - Counter-threshold-support: counter threshold trigger on targeted data object is supported
 - Transport-protocol: Indicate transport protocol to carry subscription information
 - Encoding: Indicate encoding format to encode subscribed data
 - Compression-mode: indicate compression method to compress the subscribed data

Usage example of telemetry data tagging capability



a. Telemetry data tagging advertisement

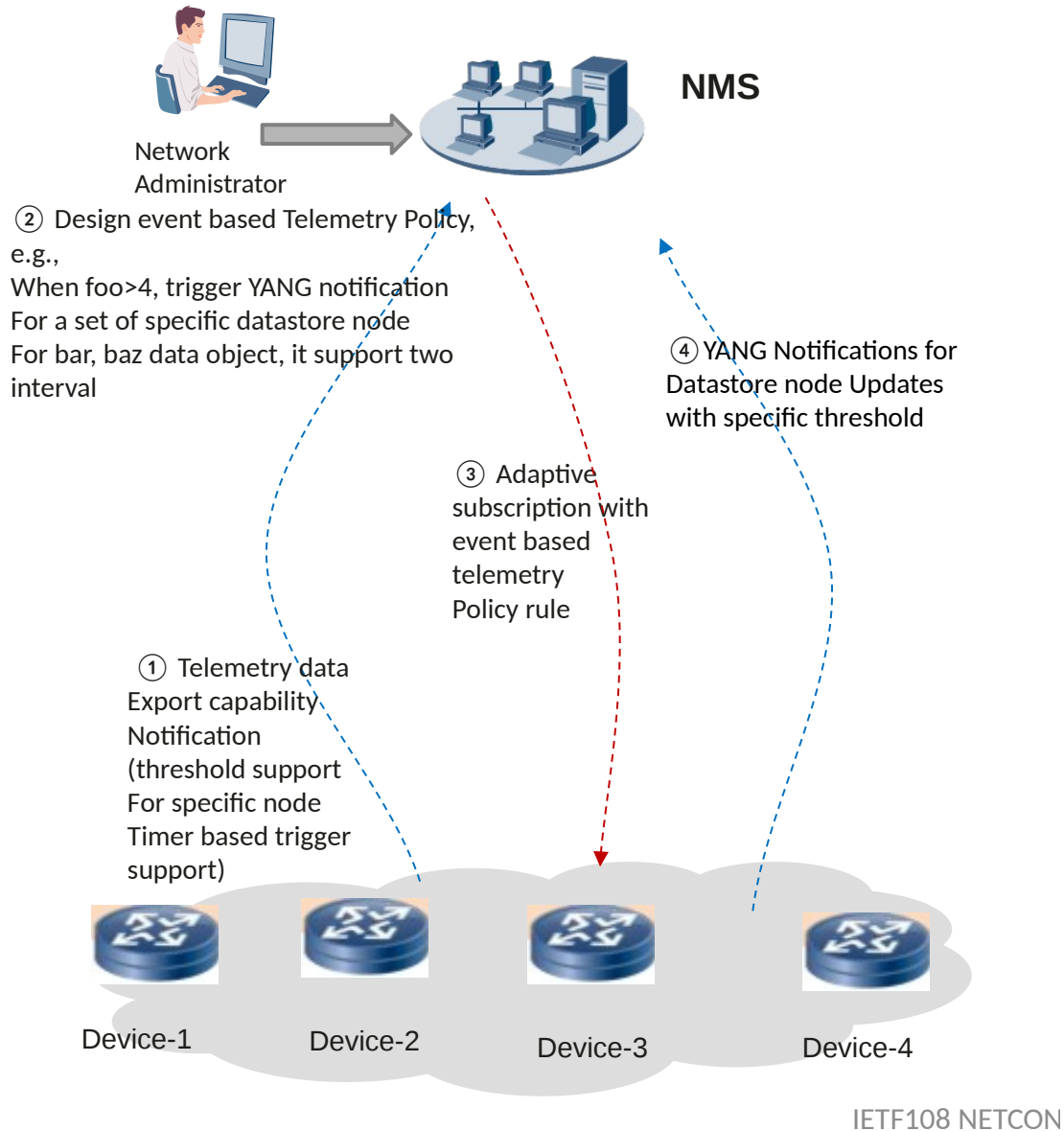
```

<?xml version="1.0" encoding="UTF-8"?>
<instance-data-set xmlns=\
  "urn:ietf:params:xml:ns:yang:ietf-yang-instance-data">
  <name>acme-router-notification-capabilities</name>
  <content-schema>
    <module>ietf-system-capabilities@2020-03-23</module>
    <module>ietf-notification-capabilities@2020-03-23</module>
    <module>ietf-data-export-capabilities@2020-03-23</module>
  </content-schema>
  <!-- revision date, contact, etc. -->
  <description>Defines the notification capabilities of an acme-router.
  The router only has running, and operational datastores.
  Every change can be reported on-change from running, but
  only config=true nodes and some config=false data from operational.
  Statistics are not reported based on timer based trigger and counter
  threshold based trigger.
</description>
  <content-data>
    <system-capabilities \
      xmlns="urn:ietf:params:xml:ns:yang:ietf-system-capabilities" \
      xmlns:inc=\
        "urn:ietf:params:xml:ns:yang:ietf-notification-capabilities" \
      xmlns:ds="urn:ietf:params:xml:ns:yang:ietf-datastores">
      <datastore-capabilities>
        <datastore>ds:operational</datastore>
        <per-node-capabilities>
          <node-selector>\
            /if:interfaces/if:interface/if:statistics/if:in-errors\
          </node-selector>
          <sec:self-describing-capabilities>
            <sec:self-tag-id>hardware</sec:self-tag-id>
            <sec:opm-tag>metric</sec:opm-tag>
            <sec:operation-type>avg</sec:operation-type>
          </sec:self-describing-capabilities>
        </per-node-capabilities>
      </datastore-capabilities>
    </system-capabilities>
  </content-data>
</instance-data-set>
  
```

- a. The publisher advertise telemetry data node capability to the subscriber.
- b. Subscriber sends a establish- subscription RPC to subscribe specific data objects that are interests to the client application from the publisher.

Usage Example of Telemetry Data Export Capability

a. Telemetry data export capability advertisement using YANG instance file format



```
<per-node-capabilities>
  <node-selector>\
    /if:interfaces/if:interface/if:statistics\
  </node-selector>
  <inc:subscription-capabilities>
    <inc:minimum-dampening-period>5
    </inc:minimum-dampening-period>
    <inc:on-change-supported>\
      state-changes\
    </inc:on-change-supported>
  </inc:subscription-capabilities>
</per-node-capabilities>
<per-node-capabilities>
  <node-selector>\
    /if:interfaces/if:interface/if:statistics/if:out-octets\
  </node-selector>
  <dec:data-export-capabilities>
    <dec:timer-event-support>true</dec:timer-event-support>
    <dec:sampling-interval>
      <dec:period>5</dec:period>
      <dec:count>6</dec:count>
    </dec:sampling-interval>
    <dec:sampling-interval>
      <dec:period>60</dec:period>
      <dec:count>6</dec:count>
    </dec:sampling-interval>
    <dec:threshold-event-support>>false</dec:threshold-event-support>
  </dec:data-export-capabilities>
</per-node-capabilities>
</per-node-capabilities>
<per-node-capabilities>
  <node-selector>\
    /if:interfaces/if:interface/if:statistics/if:in-errors\
  </node-selector>
  <dec:data-export-capabilities>
    <dec:timer-event-support>>false</dec:timer-event-support>
    <dec:threshold-event-support>true</dec:threshold-event-support>
  </dec:data-export-capabilities>
</per-node-capabilities>
```

Next Step

- Key values of telemetry data tagging capability:
 - Identify Performance measurement related data for service assurance application.
 - Provide Network visibility to Network load, traffic flow, capacity, Network QoS data category in milliseconds or seconds
 - ...
- Key values of data export capability:
 - Provide flexibility to select different transport specific parameters, e.g., transport protocol
 - Avoid unexpected failure due to lacking capability exchanging
 - Allow various subscription policy based on threshold support, message bundling support, timer-event-support;
- Adopt them as WG work item?